

SUBSOIL DRAINAGE OF TOWNS.

The salubrity of towns depends, in a very great measure, on the wet or dry state of the lands near to and upon which they are built. Lands saturated with water, and lands covered with stagnant pools, exhale large quantities of moisture, which make the atmosphere excessively humid and thilly, and sometimes produce thick mists and fogs. The atmosphere, moreover, becomes impregnated with the chemical impurities which arise from the decompositions of vegetable matter on such surfaces. Hence many diseases are aggravated by, while others are wholly traceable to, this cause. Dwellings that are erected on wet ground suck up moisture therefrom, causing the walls, floors, and rooms to be continually damp and cold. It is extremely desirable, therefore, that all such lands in and near populous districts, especially those which are to be occupied by dwellings, should be relieved of all superabundant moisture, and kept as dry as possible.

The effect of thorough drainage is to make ground, before saturated with water, dry, warm, and healthy. It also dries, warms, and purifies the atmosphere; modifies and chastens the climate; and the usual train of evils, discomfort, and ill-health are, in consequence, greatly remedied, and in some instances prevented. It follows, therefore, that in order to preserve the health of towns, their entire site, as well as that of the wet and marshy lands adjacent thereto, should be thoroughly drained. This, it is obvious, is a work as essentially necessary to be done as providing means for carrying off the waste water and soil from the houses. But since stoneware and other impermeable pipe sewers and drains have come into use, the drainage of the subsoil has been greatly neglected, and latterly it would appear to be entirely forgotten. These pipes can only convey away the fluids which are discharged into them at the various inlets; for, as the material is impervious, and as the joints all round are stopped with cement, it is evident that no water can escape into them from the subsoil. Hence, in many situations, where these pipe sewers have been and are now being put down, the ground is as wet as before the pipes were laid. No provision whatever is made to draw the water out of the subsoil, and so free the foundations of the houses from damp. This is a great error, which, in all future drainage works of this nature, should be avoided.

Preliminary to the putting down of sewers and main drains, as well as to the erection of houses, the condition of the ground as to dampness should be ascertained. This is an operation now never attended to, but which should on no account be neglected where it is proposed to lay down impermeable pipes; for if the ground be wet it will remain so if only such pipes be put in. Everywhere the subsoil should be thoroughly drained down to at least four or five feet below the foundations of the houses. This should be effected by forming permeable sewers at intervals, along the main roads and streets, of a material such as brick, which will admit the land water, and the rain which sinks into the ground, to percolate through the brickwork. The outfalls and inclinations of these sewers should be regulated so that smaller brick or permeable branch sewers can be laid from them through the minor streets lying between the main ones, at depths sufficient to drain the subsoil down to the level above stated.

From these sewers small porous drains should be continued immediately along the front and rear, as well as through and under the houses, which drains would not only dry the ground, but would also serve to convey away the surface-water from the roofs, yards, areas, and gardens, while the sewers and main drains would serve as outfalls for the drainage of the roads and streets. Thus would the entire subsoil of all the roads and streets, of the yards, areas, and gardens, at the front and rear of the houses, be effectually and permanently drained: the rain, as it falls on the surface, would be caught and carried off at once; and the land, as well as the houses, would be made perfectly dry and healthy.

It is not intended to depreciate in the slightest degree the value of stoneware and other impermeable pipes for sewers and house-drains. For these purposes such pipes are most indispensable, as, when properly laid and jointed, they effectually prevent the liquid refuse and soil from escaping into and filtering through the land; but, at the same time, they do not afford means for the water in the subsoil to drain away, and, therefore, the drainage, as a whole, cannot be said to be efficiently executed. Now, as it is absolutely essential that the subsoil should be thoroughly drained, and kept permanently dry, other sewers and drains of a porous nature, or such as would allow the passage of water into them from the land, should be laid down as well. This should be done, if the drainage is to be performed scientifically and properly, as a separate system, or in combination with the soil drains, either of which plans can easily be effected.

It would also add much to the dryness, salubrity, and value of houses if land drains—that is to say, pipe drains, capable of admitting water through their substance and at the joints—were to be laid down below and outside the foundations of all the exterior walls of buildings, particularly those walls sunk into or placed against the ground, in addition to the dry areas usually provided. The rain and land water, in soaking into the soil, and in flowing to the lowest places, would be intercepted by these drains, and so prevented from running under the houses and stagnating there. This would also tend very materially to keep the land around and under the houses dry, and so preserve the walls, floors, rooms, and furniture from damp and dilapidation. The cost of putting down such drains would be trifling and of no moment, as compared to the comfort and benefit that would be derived from the general adoption of this plan.

THE BRITISH INSTITUTION.

THIS annual exhibition of modern art was opened to the public on Monday, the 10th inst. The catalogue names 538 works, including the sculpture. As a display, it averages more than the usual amount of mediocrity, mingled with some few of considerable excellence. Four painters and one sculptor, among the Royal Academicians, and three associates, form the only contributors from that body. F. R. Lee, R.A., exhibits a wild and romantic site of Glen Loeckey; T. Creswick, A.R.A., two landscapes, and R. Redgrave, A.R.A., a landscape with a ruined hermitage (234); in the foreground of this last picture the wild herbage is carefully illustrated with true botanical knowledge. The talent of these three landscape painters, being fully appreciated, needs no remark. Mr. Creswick steps out of his usual line of subject, and, in a large picture, gives, in his best manner, a broad expanse of country, to which R. Ansell has contributed a clever group of agricultural animals in the foreground. By D. Roberts, R.A., there is a portion of the Portico of the Temple of Osiris—an admirable picture, illustrating the wonderful architecture of the Egyptians, and its polychromy. A half-length figure, of life size, by H. W. Pickersgill, R.A., entitled "The Last of the Abencerrages contemplating Granada," is finely painted. "The Sea-Cave," by W. E. Frost, A.R.A., consists of a single female figure crouching in a rocky recess on the seashore. The colour of the flesh is very beautiful, and the execution equally elaborate, but the expression of the face and shape of the head is less satisfactory.

"Mary Beatrice of Modena, Consort of James II., seeking Shelter under the Walls of old Lambeth Church," by F. Newenham, is a picture of great pretension, and also of great merit, yet not without some curable defects. The queen is of life size, holding her infant in her arms: there is a good deal of its grandiose in her form, and the expression of the countenance is satisfactory. The black robe she wears is not detached from the shadow cast by her form on the wall, and gives it an appearance of uncouth clumsiness, which a few feeble reflected lights would have lessened.

Notwithstanding some weak points, it exhibits high qualities of art. 448 is a circular picture, entitled "History," by J. Sant. Mr. Sant achieved great success last year by a similar picture, called "Astronomy," and this appears a continuation of the same idea. The figure personifying History is a half-length female of some beauty, with a book, drawn with great purity and learning, and imbued with charming tones of colour, particularly in the shades. It is wanting in the dignity and severity of History. In the execution a strange difficulty is offered by somewhat that would apparently be the ornament of a girder, but from the absence of any graduation of tint to give it a circular form, and from the colour employed, the body of the female appears pressed upon by a wooden box.

(233) "Washing of Hands in a Turkish Harem," by Walter Maddox, is a cabinet picture of high finish and rich colours. (268) "Cupid," by C. Brocky—a life-sized boy floating in the air—is noticeable for the freshness of the flesh tints. (369) "Blanche," by Frank Stone, a little picture, consisting of a small half-length figure, is painted with more solidity than this artist's larger works, and will doubtless be a favourite. (459) "A Study," by W. Wells, a gem for finish and magnificent colour, consisting of small half-length figures at a table: one, playing a violin, reminds the spectator somewhat of G. Dow's own portrait similarly occupied at a window. The hangers have shown want of discrimination in placing this beautiful little work on the floor line. (491) "Sunset off the Isle of Arran," by J. Danby, is a clever marine picture by a promising son of the veteran associate. (492) "The Infant Moses," by W. J. Grant, a small historical subject well placed on the canvas. (501) "Van Dyck at Savenheim," by T. Dehauss, is a very clever work, remarkable for truth of expression, finish, and many other good qualities.

Among the worthy specimens the following may be named, either for their pleasing qualities or artistic execution:—(25) "Grace," by F. Goodall, although inferior to former efforts by the same artist, is a good picture. (29) "The Farm—Evening," by J. Linnell, is brilliant in colour, a small work, but a gem for its lustre. (50) "Children feeding a Tame Eagle," by F. Taylor, is painted in a bold and dashing style. (65) "The Eagle's Throne," by J. Wolf, is firmly conceived and painted. H. J. Boddington is scarcely so good as usual: the distance in 72, "A Bright Summer's Noon," is cleverly painted. (70) "Signor Don Sancho Panza," by J. Gilbert, is characteristic. (136) "The Sycamore Point, on the Coast of Berwickshire," by J. Hall, is a purely geological diagram, without the smallest pretensions to forming a picture. (142) "Early Moonlight, Bristol Harbour," an ice scene, by C. Branwhite, is one of the best works of this class he has exhibited. 133 is a "Musidora," by H. Pickersgill, delicate and graceful. (167) "Chips," by J. Linnell, with much that is very fine, is less satisfactory than his smaller work: the figures damage it. (248) "St. Anthony's Day in Rome," by G. H. Thomas, is more deserving of being on the line than some that are there. (275) A fish piece, by H. J. Rolfe, is perfect of its class. (320) "Columbus," by A. Colin is French artist, displays that earnestness and thoughtfulness which are found in modern English works less often than we desire. (461) "The Ballad Singer," by R. Rothwell, has some charming qualities, but is marred by the distorted countenance of the chief figure.

There are not many architectural pictures, and none of them present any novelty of subject to the student or lover of this branch of art. The most important are a large interior of Westminster Abbey, by a Belgian painter, M. Genisson; and a long view, by Wingfield, of the Cartoon Gallery, Hampton Court.

Miss J. Mazlode's "Village School" (8): (125) "Nature," by Rothwell; (176) "The Forest of Arden," by John Martin; (206) "The Harvest Field at Wargrave," by G. A. Williams; (277) "A Levantine Sunset," W. Lantou; (313) "Il Rio del Carmine,"